

CO-PRODUCTS: ACQUIRING MORE THAN JUST ENERGY FROM ENERGY CROPS

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The primary purpose of refining a barrel of oil is to produce energy related products such as gasoline, heating oil, and jet fuel. However, about 20% of each barrel of oil is refined into non-energy related co-products, including ink, crayons, bubble gum, dishwashing liquids, deodorant, eyeglasses, records, tires, ammonia, and heart valves. While constituting a relatively small fraction of refined petroleum, co-products play a critical role in the economics of the petroleum industry. A similar model has been proposed for biorenewable energy resources. Even though they are produced in much lower quantities, co-products can increase the profitability of energy production from biomass if they are of sufficient market value or take advantage of what would otherwise be waste streams. Two approaches were evaluated for adding value to bioenergy production through co-products. The first approach is a method using High Performance Thin Layer Chromatography (HPTLC) to identify high-value phytochemicals with existing market potential within waste streams or intermediate stages of energy crop processing. The second is utilization of post processing materials from thermochemical conversion as a soil amendment to reduce fertilizer requirements and increase carbon sequestration in energy crop production. In the later case the co-product would not only have a market value, but also contribute to increased sustainability of energy crop production.